

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of: Hiroshi KURACHI, Yuichi SASAKI and Takeya MIYASHITA

Ser. No.: 10/807,859

Group Art Unit: 1709

Filed: March 24, 2004

Examiner: Matthew J. Merkling

Confirmation No.: 5516

For: GAS SENSOR

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Commissioner for Patents
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Alexandria, VA 22313-1450

CERTIFICATION OF EFS TRANSMISSION

I hereby certify that this paper is being transmitted via EFS to the Patent and Trademark Office on *August 9, 2007*.

Janet M. Stevens
Janet M. Stevens

**REQUEST FOR RECONSIDERATION
AFTER FINAL REJECTION**

Sir:

In response to the Office Action mailed May 16, 2007, Applicants respectfully request reconsideration and withdrawal of the rejection of record based on the following arguments.

Claims 1-3 and 5-11 are pending herein.

Claims 1-3, 5 and 6-11 were rejected under §103(a) over Kato in view of Yamada and Sugiyama. Applicants respectfully traverse this rejection.

Claim 1 recites a gas sensor including a sensor element having a gas-introducing hole close to an end of the sensor element and a heater for maintaining a predetermined temperature in a first space and a second space within the sensor element, wherein $0.3 \leq (W_c/W_e) < 0.7$, where W_e represents a lateral width of the end of the sensor element and W_c represents a lateral width of the gas-introducing hole. Claim 1 also requires that $0.2 <$

$(La/We) < 0.5$, where La represents a distance from the projected position of an end of the heater on the upper face of the sensor element to the end of the sensor element.

As stated in the Office Action, Kato fails to teach or suggest a gas sensor having dimensions that satisfy the claimed Wc/We and La/We ratios. The Examiner relies on Yamada for allegedly teaching gas sensor dimensions sufficient to satisfy the claimed Wc/We ratio and cites to Sugiyama as providing “the motivation to arrive at the dimensional relationship between the oxygen sensor and the width of the gas-introducing hole, La/We ratio” (Office Action at page 7).

However, the Sugiyama and Yamada references contradict one another with respect to the minimum margin distance requirements. Specifically, Sugiyama discloses that the minimum distance between the edge of the heater element and the edge of the sensor should be within the range of $0.1 \text{ mm} \leq X \leq 0.6 \text{ mm}$. Using the maximum value disclosed by Sugiyama for the claimed La value provides the following result:

$$\frac{La}{We} = \frac{0.6}{9.0} = .15$$

This does not satisfy the claimed La/We ratio.

As stated in the Office Action, Yamada teaches that a margin width of greater than 0.7 mm yields strong resistance to thermal shocks (col. 9, lines 34-36). Using 0.7 mm for the claimed La value in the context of Yamada provides the following result:

$$\frac{La}{We} = \frac{0.7}{4.0} = 0.175$$

This does not satisfy the claimed La/We ratio.

Thus, the Examiner has failed to establish a *prima facie* case of obviousness, because it is impermissible within the framework of §103 to pick and choose from any one reference only so much as will support a given position to the exclusion of the other parts. Along this same line, it is illogical to combine references that contradict one another.

In addition to the above, the attendant advantages attributable to the claimed invention are neither disclosed nor suggested by the applied references. Applicants determined that the placement of the heater was critical to the prevention of cracks from cooling too rapidly, which differs from the purpose of the margins in the heater placement in the cited references (to prevent thermal shock from heating too rapidly). The Examiner has asserted that the purpose of the margins in Sugiyama and Yamada are the same as the present invention. In support of this position, the Examiner cited to Yamada, column 3, lines 12-14, which recite “a small size [of the oxygen sensor] brings about a strong resistance against breakage caused by repeated thermal shocks due to rapid heating and rapid cooling,” and Sugiyama, column 5, lines 47-50, which recite “a voltage is applied to the heating element 19 of each sample to heat the sample at a given temperature for one minute. Afterwards, a sample was cooled down to room temperature in two minutes.” The cited section of Yamada relates to the overall size of the sensor providing resistance to thermal shock and the cited section of Sugiyama discloses a power cycle test. Thus, neither cited section supports the Examiner’s position that the purpose of the gaps in Sugiyama and Yamada are to prevent the thin zirconia portion of the gas sensor between the second space and the referenced gas-introducing space from cracking due to cooling too rapidly when the hot gas passes from the second space to the reference gas-introducing space.

Based on the above, none of the references satisfy the claimed La/We ratio and the Examiner's reason for combining the references appears to use hindsight reconstruction in an attempt to satisfy the requirements of claim 1, which is impermissible.

Accordingly, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

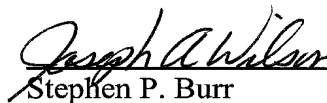
If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

August 9, 2007

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